

Referências Bibliográficas

ABREU, C.R.A.; MACIAS-SALINAS, R.; TAVARES, F.W.; CASTIER, M. Monte Carlo simulation of the packing and segregation of spheres in cylinders. **Brazilian Journal of Chemical Engineering**, v. 16, n. 4, p. 394 - 405, 1999.

ABREU, C.R.A. **Método de Monte Carlo Aplicado à Compactação e Segregação de Partículas**. 2000. 144 p. Dissertação (Mestrado em Tecnologia de Processos Químicos e Bioquímicos) – Escola de Química, Universidade Federal do Rio de Janeiro, Rio de Janeiro.

ADAMS, D.J.; MATHESON, J. Computation of dense random packings of hard spheres. **Journal of Chemical Physics**, v. 56, p. 1989 - 1994, 1972.

ALLEN, M.P.; TILDESLEY, D.J. **Computer simulation of liquids**. New York : Oxford University Press, 1987. 385 p.

AMES, A.L.; NADEAU, D.R.; MORELAND, J.L. **VRML 2.0 Sourcebook**, New York : John Wiley & Sons, 1996.

ASMAR, B.N.; LANGSTON, P.A.; MATCHETT, A.J., WALTERS, J.K. Validation tests on a distinct element model of vibrating cohesive particle systems. **Computers and Chemical Engineering**, v. 26, pp. 785-802, 2002.

BARKER, J.A.; WATTS, R.O. Structure of water: A Monte Carlo calculation. **Journal of Chemical Physics**, v. 3, p. 144 - 145, 1969.

BENENATI, R.F.; BROSILOW, C.B. Void fraction distribution in beds of spheres. **AIChE Journal**, v. 8, n. 3, p. 359 - 361, 1962.

BIDEAU, D.; HANSEN, A. (Editores) **Disorder and Granular Media**, North-Holland : Elsevier, 1993.

BIRD, R.B.; STEWART, W.E.; LIGHTFOOT, E.N. **Transport Phenomena**. New York : John Wiley & Sons, 1960. 780 p.

BOLHUIS, P.; FRENKEL, D. Tracing the phase boundaries of hard spherocylinders. **Journal of Chemical Physics**, v. 106, n. 2, 666 – 687, 1997.

BOYCE, W.E.; DIPRIMA, R.C. **Equações diferenciais elementares e problemas de valores de contorno**. 6.ed. Rio de Janeiro : LTC, 1998.

BRIDGWATER, J. Fundamental powder mixing mechanisms. **Powder Technology**, v. 15, p. 215 - 236, 1976.

CARTAXO, S.J.M.; ROCHA, S.C.S. Object-oriented simulation of the fluid-dynamics of gas-solid flow. **Powder Technology**, v. 117, p. 177 - 188, 2001.

CASTIER, M.; CUÉLLAR, O.D.; TAVARES, F.W. Monte Carlo simulation of particle segregation. **Powder Technology**, v. 97, p. 200 - 207, 1998.

CHENG, Y.F.; GUO, S.J.; LAI, H.Y. Dynamic simulation of random packing of spherical particles. **Powder Technology**, v. 107, p. 123 - 130, 2000.

CLEARY, P. DEM Simulation of industrial particle flows: case studies of dragline excavators, mixing in tumblers and centrifugal mills. **Powder Technology**, v. 109, p. 83 - 104, 2000.

CLEARY, P.W.; HOYER, D. Centrifugal mill charge motion and power draw: comparison of DEM predictions with experiment. **International Journal of Mineral Processing**, v. 59, n. 2, p. 131 - 148, 2000.

CLEARY, P.W.; SAWLEY, M.L. DEM modelling of industrial granular flows: 3D case studies and the effect of particle shape on hopper discharge. **Applied Mathematical Modelling**, v. 26, p. 891 - 11, 2002.

CLEARY, P.W.; MORRISON, R.; MORRELL, S. Comparison of DEM and experiment for a scale model SAG mill. **International Journal of Mineral Processing**, v. 68, p. 129 - 165, 2003.

COOKE, M.H.; STEPHENS, D.J.; BRIDGWATER, J. Powder mixing - a literature survey. **Powder Technology**, v. 15, p. 1 - 20, 1976.

CUNDALL, P.A. Formulation of a three-dimensional distinct element model – Part I. A scheme to detect and represent contacts in a system composed of many polyhedral blocks. **International Journal Of Rock Mechanics And Mining Sciences & Geomechanics Abstracts**, v. 25, n. 3, pp. 107 - 116, 1988.

CUNDALL, P.A.; STRACK, O.D.L. A discrete numerical model for granular assemblies. **Géotechnique**, v. 29, n. 1, p. 47 - 65, 1979.

DEVILLARD, P. Scaling behaviour in size segregation (“Brazil nuts”). **Journal of Physics of France**, v. 51, p. 369 - 373, 1990.

DI FELICE, R. The voidage function for fluid-particle interaction systems. **International Journal of Multiphase Flow**. v. 20, n. 8, p. 153 - 159, 1994.

_____. Hydrodynamics of liquid fluidisation. **Chemical Engineering Science**, v. 50, n. 8, p. 1213 - 1245, 1995.

DONG, H.; MOYS, M.H. Measurement of impact behaviour between balls and walls in grinding mills. **Minerals Engineering**, v. 16, p. 543 - 550, 2003.

FELLER, W. **An Introduction to Probability Theory and Its Applications**. New York : John Wiley & Sons, 1950.

FERNANDO, D.N.; WASSGREN, C.R. Effects of vibration method and wall boundaries on size segregation in granular beds. **Physics of Fluids**, v. 15, n. 11, p. 3458 - 3467, 2003.

FRENKEL, D.; SMIT, B. **Understanding Molecular Simulation: From Algorithms to Applications**, 2. ed. San Diego : Academic Press, 2002. 638 p.

FURUUCHI, M.; GOTOH, K. Shape separation of particles. **Powder Technology**, v. 73, n. 1, p. 1 - 9, 1992.

GALLAS, J.A.C.; HERRMANN, H.J.; SOKOLOWSKI, S. Convection cells in vibrating granular media. **Physical Review Letters**, v. 69, n. 9, p. 1371 - 1374, 1992.

GALLAS, J.A.C.; HERRMANN, H.J.; POSCHEL, T.; SOKOLOWSKI, S. Molecular dynamics simulation of size segregation in three dimensions. **Journal of Statistical Physics**, v. 82, n.1-2, p. 43 - 451, 1996.

GALLAS, J.A.C.; HERRMANN, H.J. As mil e uma maravilhas dos meios granulares. **Ciência Hoje**, v. 23, n. 136, p. 18 - 26, 1998.

GOLDHIRSCH, I. Rapid granular flows. **Annual Review of Fluid Mechanics**, v. 35, p. 267-293, 2003.

GOODLING, J.S.; VACHON, R.I.; STELPFLUG, W.S.; YING, S.J.; KHADER, M.S. Radial porosity distribution in cylindrical beds packed with spheres. **Powder Technology**, v. 35, p. 23 - 29, 1983.

GOTOH, K.; JODREY, W.S.; TORY, E.M. Variation in the local packing density near the wall of a randomly packed bed of equal spheres. **Powder Technology**, v. 20, p. 257 - 260, 1978.

GOVINDARAO, V.M.H.; FROMENT, G.F. Voidage profiles in packed beds of spheres. **Chemical Engineering Science**, v. 41, n. 3, p. 533 - 539, 1986.

HAFF, P.K; WERNER, B.T. Computer simulation of the mechanical sorting of grains, **Powder Technology**, v. 48, p. 239 - 245, 1986.

HEFFELFINGER, G.S. Parallel atomistic simulations. **Computer Physics Communications**, v. 128, p. 219 - 237, 2000.

HERRMANN, H.J. Grains of understanding. **Physics World**, v. 10, n. 11, p. 31 - 34, 1997.

HIGASHITANI, K.; IIMURA, K.; SANDA, H. Simulation of deformation and breakup of large aggregates in flows of viscous fluids. **Chemical Engineering Science**, v. 56, p. 2927 - 2938, 2001.

HILL, T.L. **Introduction to Statistical Thermodynamics**. London : Addison-Wesley, 1960.

HOOMANS, B.P.B.; KUIPERS, J.A.M.; BRIELS, W.J.; VAN SWAAIJ, W.P.M. Discrete particle simulation of bubble and slug formation in a two-dimensional gas-fluidised bed: a hard-sphere approach. **Chemical Engineering Science**, v. 51, n. 1, p. 99 - 118, 1996.

HOOMANS, B.P.B.; KUIPERS, J.A.M.; VAN SWAAIJ, W.P.M. Granular dynamics simulation of segregation phenomena in bubbling gas-fluidised beds. **Powder Technology**, v. 109, p. 41 - 48, 2000.

HOOMANS, B.P.B.; KUIPERS, J.A.M.; MOHD SALLEH, M.A.; STEIN, M.; SEVILLE, J.P.K. Experimental validation of granular dynamics simulations of gas-fluidised beds with homogeneous in-flow conditions using positron emission particle tracking. **Powder Technology**, v.116, p. 166 - 177, 2001.

HSIAU, S.S.; YANG, S.C. Numerical simulation of self-diffusion and mixing in a vibrated granular bed with the cohesive effect of liquid bridges. **Chemical Engineering Science**, v. 58, p. 339 - 351, 2003.

HUNT, M.L.; WEATHERS, R.C.; LEE, A.T.; BRENNEN, C.E.; WASSGREN, C.R. Effects of horizontal vibration on hopper flows of granular materials. **Physics of Fluids**, v. 11, n. 1, p. 68 - 75, 1999.

IINOYA, K.; GOTOH, K.; HIGASHITANI, K. (Editores) **Powder Technology Handbook**, 1 ed. New York : Marcel Dekker Inc., 1991.

JODREY, W.S.; TORY, E.M. Simulation of random packing of spheres. **Simulation**, v. 32, p. 1 - 12, 1979.

JOHNSON, A.A.; TEZDUYAR, T.E. 3D simulation of fluid-particle interactions with the number of particles reaching 100. **Computer Methods in Applied Mechanics and Engineering**, v. 145, p. 301 - 321, 1997.

KAFUI, K.D.; THORNTON, C; ADAMS, M.J. Discrete particle-continuum fluid modelling of gas-solid fluidised beds. **Chemical Engineering Science**, v. 57, n. 13, p. 2395 - 2410, 2002.

KARION, A.; HUNT, M. Wall stresses in granular couette flows of mono-sized particles and binary mixtures. **Powder Technology**, v. 109, p. 145 - 163, 2000.

KAWAGUCHI, T.; TANAKA, T.; TSUJI, Y. Numerical simulation of two-dimensional fluidized beds using the discrete element method (comparison between the two- and three-dimensional models). **Powder Technology**, v. 96, p. 129 - 138, 1998.

KAWAGUCHI, T.; SAKAMOTO, M.; TANAKA, T.; TSUJI, Y. quasi-three-dimensional numerical simulation of spouted beds in cylinder. **Powder Technology**, v. 109, p. 3 - 12, 2000.

KANEKO, Y.; SHIOJIMA, T.; HORIO, M. DEM simulation of fluidized beds for gas-phase olefin polymerization. **Chemical Engineering Science**, v.54, p. 5809 - 5821, 1999.

KUBIE, J. Influence of containing walls on the distribution of voidage in packed beds of uniform spheres. **Chemical Engineering Science**, v. 43, n. 6, p. 1403 - 1405, 1988.

KUO, H.P.; KNIGHT P.C.; PARKER, D.J.; TSUJI, Y.; ADAMS, M.J.; SEVILLE, J.P.K. The influence of DEM simulation parameters on the particle behaviour in a V-mixer. **Chemical Engineering Science**, v. 57, n. 17, p. 3621 - 3638, 2002.

KUWAGI, K.; MIKAMI, T.; HORIO, M. Numerical simulation of metallic solid bridging particles in a fluidized bed at high temperature. **Powder Technology**, v. 109, p. 27 - 40, 2000.

KUWAGI, K.; HORIO, M. A numerical study on agglomerate formation in a fluidized bed of fine cohesive particles. **Chemical Engineering Science**, v. 57, p. 4737 - 4744, 2002.

LAN, Y.; ROSATO, A.D. Macroscopic behavior of vibrating beds of smooth inelastic spheres. **Physics of Fluids**, v. 7, n. 8, p. 1818 - 1830, 1995.

_____. Convection related phenomena in vibrated granular beds. **Physics of Fluids**, v. 9, n. 12, p. 3615 - 3624, 1997.

LIAN, G.; THORNTON, C.; ADAMS, M.J. Discrete particle simulation of agglomerate impact coalescence. **Chemical Engineering Science**, v. 53, n. 19, p. 3381 - 3391, 1998.

MAEDA, Y.; MARUOKA, Y.; MAKINO, H.; NOMURA, H. Squeeze molding simulation using the distinct element method considering green sand properties. **Journal of Material Processing Technology**, v. 135, p. 172-178, 2003.

MALIK, M.; MUJUMDAR, A.; DAVE, R. Numerically simulated flow characteristics of particulate beds in oscillating sectorial containers. **Powder Technology**, v. 133, p. 91 - 105, 2003.

MALISKA, C.R. **Transferência de calor e mecânica dos fluidos computacional**. Rio de Janeiro : LTC, 1995, 424 p.

MARIANI, N.J.; MARTÍNEZ, O.M.; BARRETO, G.F. Computing radial packing properties from the distribution of particle centers. **Chemical Engineering Science**, v. 56, p. 5693 - 5705, 2001.

MASSON, S.; MARTINEZ, J. Effect of particle mechanical properties on silo flow and stresses from distinct element simulations. **Powder Technology**, v. 109, p. 164 - 178, 2000.

MATUTTIS, H.G.; LUDING, S.; HERRMANN, H.J. Discrete element simulations of dense packings and heaps made of spherical and non-spherical particles. **Powder Technology**, v. 109, p. 278 - 292, 2000.

MCCARTHY, J.J.; KHAKHAR, D.V.; OTTINO, J.M. Computational studies of granular mixing. **Powder Technology**, v. 109, p. 72 - 82, 2000.

MCQUARRIE, D.A. **Statistical Mechanics**. New York : Harper Collins, 1976. 641 p.

METROPOLIS, N.; ROSENBLUTH, A.W.; ROSENBLUTH, M.N.; TELLER, A.H.; TELLER, E. Equation of state calculations by fast computing machines. **Journal of Chemical Physics**, v. 21, p. 1087 - 1092, 1953.

MIKAMI, T.; KAMIYA, H.; HORIO, M. Numerical simulation of cohesive powder behavior in a fluidized bed. **Chemical Engineering Science**, v. 53, n. 10, p. 1927 - 1940, 1998.

MINDLIN, R.D.; DERESIEWICZ, H. Elastic spheres in contact under varying oblique forces. **ASME Journal of Applied Mechanics**, v. 20, p. 327 - 344, 1953.

MISHRA, B.K.; MEHROTRA, S.P. A jig model based on the discrete element method and its experimental validation. **International Journal of Mineral Processing**, v. 63, p. 177 - 189, 2001.

MISHRA, B.K.; MURTY, C.V.R. On the determination of contact parameters for realistic DEM simulations of ball mills. **Powder Technology**, v. 115, p. 290-297, 2001.

MISHRA, B.K. A review of computer simulation of tumbling mills by the discrete element method: Part I – contact mechanics. **International Journal of Mineral Processing**, v. 71, p. 73 - 93, 2003a.

_____. A review of computer simulation of tumbling mills by the discrete element method: Part II – practical applications. **International Journal of Mineral Processing**, v. 71, p. 95 - 112, 2003b.

MOAKHER, M.; SHINBROT, T.; MUZZIO, F.J. Experimentally validated computations of flow, mixing and segregation of non-cohesive grains in 3D tumbling blenders. **Powder Technology**, v. 109, p. 58-71, 2000.

MUELLER, G.E. Prediction of radial porosity distributions in randomly packed fixed beds of uniformly sized spheres in cylindrical containers. **Chemical Engineering Science**, v. 46, n. 2, p. 706 - 708, 1991.

_____. Radial void fraction distributions in randomly packed fixed beds of uniformly sized spheres in cylindrical containers. **Powder Technology**, v. 72, p. 269 - 275, 1992.

_____. Numerical simulation of packed beds with monosized spheres in cylindrical containers. **Powder Technology**, v. 92, p. 179, 1997.

MUGURUMA, Y.; TANAKA, T.; TSUJI, Y. Numerical simulation of particulate flow with liquid bridge between particles (simulation of centrifugal tumbling granulator). **Powder Technology**, v. 109, p. 49 - 57, 2000.

NANDAKUMAR, K.; YIQIANG, S.; CHUANG, K.T. Predicting geometrical properties of random packed beds form computer simulation. **AIChE Journal**, v. 45, n. 11, p. 2286 - 2297, 1999.

NOLAN, G.T.; KAVANAGH, P.E., Computer simulation of random packing of hard spheres. **Powder Technology**, v.72, p. 149 - 15, 1992.

_____. Random packing of nonspherical particles. **Powder Technology**, v.84, p. 199 - 205, 1995.

NUSSENZVEIG, H.M. **Curso de física básica v.1**. 2.ed. São Paulo : Edgar Blücher, 1988. 531 p.

NUSSENZVEIG, H.M. **Curso de física básica v.2**. 2.ed. São Paulo : Edgar Blücher, 1990. 502 p.

OTTINO, J. M.; KHAKHAR, D.V. Mixing and segregation of granular materials. **Annual Review of Fluid Mechanics**, v. 32, p. 55 - 91, 2000.

OUYANG, J.; LI, J. Particle-Motion-resolved discrete model for simulating gas-solid fluidization. **Chemical Engineering Science**, v. 54, p. 2077 - 2083, 1999.

_____. Discrete simulations of heterogeneous structure and dynamic behavior in gas-solid fluidization. **Chemical Engineering Science**, v. 54, p. 5427 - 5440, 1999.

OUADFEL, H.; ROTHENBURG, L. An algorithm for detecting inter-ellipsoid contacts. **Computers and Geotechnics**, v. 24, n. 4, p. 245 - 263, 1999.

PACHECO, P. **Parallel Programming with MPI**. Los Altos, CA : Morgan Kaufmann, 1997.

PATANKAR, S.V. **Numerical Heat Transfer and Fluid Flow**. New York : Hemisphere Publications, 1981.

PRESS, W.H.; TEUKOLSKY, S.A.; VETTERLING, W.T.; FLANNERY, B.P. **Numerical Recipes in Fortran: The Art of Scientific Computing**, 2 ed. Cambridge : Cambridge University Press, 1992.

PILLAI, K.K. Voidage variation at the wall of a packed bed of spheres. **Chemical Engineering Science**, v. 32, p. 59 - 61, 1977.

QUENTREC, B.; BROT, C. New method for searching for neighbors in molecular dynamics computations. **Journal of Computational Physics**, v. 13, p. 430 - 432, 1975.

REYES, S.C.; IGLESIA, E. Monte Carlo simulations of structural properties of packed beds. **Chemical Engineering Science**, v. 46, n. 4, p. 1089 - 1099, 1991.

RHODES, M.J.; WANG, X.S.; NGUYEN, M.; STEWART, P.; LIFFMAN, K. Use of discrete element method simulation in studying fluidization characteristics: influence of interparticle force. **Chemical Engineering Science**, v. 56, p. 69 - 76, 2001.

_____. Study of mixing in gas-fluidized beds using a DEM model. **Chemical Engineering Science**, v. 56, p. 2859 - 2866, 2001.

_____. Onset of cohesive behaviour in gas fluidized beds: a numerical study using DEM simulation. **Chemical Engineering Science**, v. 56, p. 1133 - 1143, 2001.

RIDGWAY, K.; TARBUCK, K.J. Radial voidage variations in randomly packed beds of spheres of different sizes. **J. Pharm. Pharmac.**, v. 18, Sup. 188S - 175S, 1966.

_____. Voidage fluctuations in randomly-packed beds of spheres adjacent to a containing wall. **Chemical Engineering Science**, v. 23, p. 1147 - 1155, 1968.

ROBLEE, L.H.S.; BAIRD, R.M.; TIERNEY, J.W. Radial porosity variations in packed beds. **AIChE Journal**, v. 4, n. 4, p. 460 - 464, 1958.

RODRÍGUEZ, J.; ALLIBERT, C.H.; CHAIX, J.M. A computer method for random packing of spheres of unequal size. **Powder Technology**, v. 47, p. 25 - 33, 1986.

RONG, D.; MIKAMI, T.; HORIO, M. Particle and bubble movements around tubes immersed in fluidized beds - a numerical study. **Chemical Engineering Science**, v. 54, p. 5737 - 5754, 1999.

ROSATO, A.; PRINZ, F.; STANDBURG, K.J.; SWENDSEN, R. Monte Carlo simulation of particulate matter segregation. **Powder Technology**, v. 49, p. 59 - 69, 1986.

ROSATO, A.; STRANDBURG, K.J.; PRINZ, F.; SWENDSEN, R.H. Why the Brazil nuts are on top: size segregation of particulate matter by shaking. **Physical Review Letters**, v. 58, n. 10, p. 1038 - 1040, 1987.

ROSATO, A.D.; LAN, Y.; WANG, D.T. Vibratory particle size sorting in multi-component systems. **Powder Technology**, v. 66, p. 149 - 160, 1991.

ROSATO, A.D.; YACOB, D. Microstructure evolution in compacted granular beds. **Powder Technology**, v. 109, p. 255 - 261, 2000.

ROSATO, A.D.; BLACKMORE, D.L.; ZHANG, N.; LAN, Y. A perspective on vibration-induced size segregation of granular materials. **Chemical Engineering Science**, v. 57, p. 265 - 275, 2002.

RUMPF, H. **Particle Technology**. Londres : Chapman and Hall, 1990. 216 p.

SEDERMAN, A.J.; ALEXANDER, P.; GLADDEN, L.F. Structure of packed beds probed by magnetic resonance imaging. **Powder Technology**, v. 117, p. 255 - 269, 2001.

SEIBERT, K.D.; BURNS, M.A. Simulation of fluidized beds and other fluid-particle systems using statistical mechanics. **AIChE Journal**, v. 42, n. 3, p. 660 - 670, 1996.

_____. Simulation of structural phenomena in mixed particle fluidized beds, **AIChE Journal**, v. 44, n. 3, p. 528 - 536, 1998.

SMITH, L.; TÜZÜN, U. Life after computer simulations: towards establishing bulk evolution rules based on discrete granular dynamics. **Chemical Engineering Science**, v. 57, p. 253 - 264, 2002.

SOPPE, W. Computer simulation of random packings of hard spheres. **Powder Technology**, v. 62, p. 189 - 196, 1990.

THADANI, M.C.; PEEBLES, F.N. Variation of local void fraction in randomly packed beds of equal spheres, **I&EC Process Design and Development**, v. 5, n. 3, p. 265-268, 1966.

THORNTON, C. Coefficient of restitution for collinear collisions of elastic perfectly plastic spheres. **ASME Journal of Applied Mechanics**, v. 64, p. 383 – 386, 1997.

TOYE, D.; MARCHOT, P.; CRINE, M.; PELSSER, A.-M.; L'HOMME, G. Local measurements of void fraction and liquid holdup in packed columns using x-ray computed tomography. **Chemical Engineering and Processing**, v. 37, p. 511 - 520, 1998.

TSUJI, Y.; TANAKA, T.; ISHIDA, T. Lagrangian numerical simulation of plug flow of cohesionless particles in a horizontal pipe. **Powder Technology**, v. 71, p. 239 - 250, 1992.

TSUJI, Y.; KAWAGUCHI, T.; TANAKA, T. Discrete particle simulation of two-dimensional fluidized bed. **Powder Technology**, v. 77, p. 79 - 87, 1993.

TSUJI, Y.; TANAKA, T.; YONEMURA., S. Cluster patterns in circulating fluidized beds predicted by numerical simulation (discrete particle model versus two-fluid model). **Powder Technology**, v. 95, p. 254 - 264, 1998.

TSUJI, Y. Activities in discrete particle simulation in Japan. **Powder Technology**, v. 113, p. 278 - 286, 2000.

VANEL, L.; ROSATO, A.; DAVE, R.N. Rise-time regimes of a large sphere in vibrated bulk solids. **Physical Review Letters**, v. 78, n. 7, p. 1255 - 1258, 1997.

VEGA, C.; LAGO, S. A fast algorithm to evaluate the shortest distance between rods. **Computers & Chemistry**, v. 18, n. 1, p. 5 - 59, 1994.

VISSCHER, W.M.; BOLSTERLI, M. Random packing of equal and unequal spheres in two and three dimensions. **Nature**, v. 239, p. 504 - 507, 1972.

VU-QUOC, L.; ZHANG, X. An elastoplastic contact force-displacement model in the normal direction: displacement-driven version. **Proceedings of the Royal Society of London, Series A**, v. 455, p. 4013 - 4044, 1999a.

_____. An accurate and efficient tangential force-displacement model for elastic frictional contact in particle-flow simulations. **Mechanics of Materials**, v. 31, p. 235 - 269, 1999b.

VU-QUOC, L.; ZHANG, X.; WALTON, O.R. A 3-D discrete-element method for dry granular flows of ellipsoidal particles. **Computer Methods in Applied Mechanics and Engineering**, v. 187, p. 483 - 528, 2000.

VU-QUOC, L.; ZHANG, X.; LESBURG, L. A normal force-displacement model for contacting spheres accounting for plastic deformation: force-driven formulation. **ASME Journal of Applied Mechanics**, v. 67, n. 2, p. 363 - 371, 2000.

_____. Normal and tangential force-displacement relations for frictional elasto-plastic contact of spheres. **International Journal of Solids and Structures**, v. 38, p. 6455 - 6489, 2001.

WALTON, O.R. Numerical simulation of inclined chute flows of monodisperse, inelastic, frictional spheres. **Mechanics of Materials**, v. 16, p. 239-247, 1993.

WALTON, O.R.; BRAUN, R.L. Viscosity, granular-temperature, and stress calculations for shearing assemblies of inelastic, frictional disks. **Journal of Rheology**, v. 30, n. 5, p. 949 - 980, 1986.

WASSGREN, C.R.; HUNT, M.L.; FREESE, P.J.; PALAMARA, J.; BRENNEN, C.E. Effects of vertical vibration on hopper flows of granular material. **Physics of Fluids**, v. 14, n. 10, p. 3439 - 3448, 2002.

WATANO, S.; SAITO, S.; SUZUKI, T. Numerical simulation of electrostatic charge in powder pneumatic conveying process. **Powder Technology**, v. 135 - 136, p. 112 - 117, 2003.

WEGRZYN, J.; GUREVICH, M. Adsorbent storage of natural gas. **Applied Energy**, v. 55, n. 2, p. 71 - 83, 1996.

WILLIAMS, J.C. The segregation of particulate materials. A review. **Powder Technology**, v. 15, p. 245 - 251, 1976.

WILLIAMS, S.R.; PHILIPSE, A.P. Random packings of spheres and spherocylinders simulated by mechanical contraction. **Physical Review E**, v. 67, art. 051301, 2003.

XU, B.H.; YU, A.B. Numerical simulation of the gas-solid flow in a fluidized bed by combining discrete particle method with computational fluid dynamics. **Chemical Engineering Science**, v. 52, n. 16, p. 2785 - 2809, 1997.

XU, B.H.; YU, A.B.; CHEW, S.J.; ZULLI, P. Numerical simulation of the gas-solid flow in a bed with lateral gas blasting. **Powder Technology**, v. 109, p. 13 - 26, 2000.

YANG, S.C.; HSIAU, S.S. Simulation study of convection cells in a vibrated granular bed. **Chemical Engineering Science**, v. 55, p. 3627 - 3637, 2000.

_____. The simulation and experimental study of granular materials discharged from a silo with the placement of inserts. **Powder Technology**, v. 120, p. 244 - 255, 2001a.

_____. The simulation of powders with liquid bridges in a 2D vibrated bed. **Chemical Engineering Science**, v. 56, p. 6837 - 6849, 2001b.

YUU, S.; ABE, T.; SAITOH, T.; UMEKAGE, T. Three-dimensional numerical simulation of the motion of particles discharging from a rectangular hopper using distinct element method and comparison with experimental data (effects of time steps and material properties). **Advanced Powder Technology**, v. 6, n. 4, p. 259-269, 1995.

ZHANG, D.; WHITEN, W.J. The calculation of contact forces between particles using spring and damping models. **Powder Technology**, v. 88, p. 59-64, 1996.

_____. Step size control for efficient discrete element simulation. **Minerals Engineering**, v. 14, n. 10, p. 1341 - 1346, 2001.

ZOU, R.P.; YU, A.B. Evaluation of the packing characteristics of mono-sized non-spherical particles. **Powder Technology**, v. 88, n. 1, p. 71 - 79, 1996.